when compared with the Norwegian lakes. But then *Holopedium gibberum* of Lake Guéry lives in a shallow pool of water! This lake is, in fact, of less extent than Lake Pavin and hardly 8 metres in depth.

With creatures of the size here in question the mass of water in Lake Pavin and much more considerable masses will hardly prove to be very different in their action.

Two principal conclusions may be drawn from the facts hitherto ascertained:—

1. The peopling of the lakes of the region of the Mont Dore appears to have been effected by passive migrations.

2. The pelagic fauna of these lakes is constituted in a general way like those of the rest of Europe, and presents common points and points of divergence when compared with these different faunas. —*Comptes Rendus*, Nov. 14, 1887, p. 951; Dec. 12, 1887, p. 1186.

The Fauna of the Podophthalmous Crustacea of the Bay of Marseilles. By M. Paul Gourret.

The author states that the number of Podophthalmous Crustacea observed by him, of which he proposes to publish a revision, amounts to 124 species or varieties, 11 of which are new. These are:—

Pinnotheres Marioni, *Galathea Parroceli* *, *Crangon Lacazei* *, *Gnathophyllum elegans*, var. *brevirostris* *, *Alpheus Gabrieli* *, *Hippolyte Marioni* *, *Pontonia vagans*, *Callianassa subterranea*, var. *minor* *, *Siriella intermedia*, *Leptomysis Marioni*, and *Nebalia bipes*, var. *elongata*.

The fauna greatly resembles that of the Adriatic—90 species are common to both. There is almost as close a similarity to the faunas of Naples, Nice, and Algeria, the number of common species oscillating between 82 and 66. The difference is much greater from the Spanish carcinological fauna (Balearic Islands and Madeira), which seems to include only 34 of the species obtained at Marseilles. This difference may be due to our imperfect knowledge of the Spanish fauna.

The following species obtained at Marseilles do not occur in any of the principal Mediterranean stations:—

Plagusia chabrus, *Pachygrapsus transversus*, *Ebalia nux*, *Eupagurus Bernhardus* and *lævis*, *Axius stirhynchus*, *Gebia deltura*, *Munida tenuimana*, *Galathodes Marionis*, and *Crangon trispinosus*.

Of these species, however, the first two are imported into Marseilles by ships from the Pacific, whilst *Ebalia nux*, *Eupagurus lævis*, *Munida tenuimana*, and *Galathodes Marionis* are species dredged from great depths. The four remaining species present a curious distributional fact, although *Gebia deltura* has been taken

* These forms were briefly described in a paper communicated by the author to the Academy on November 21, 1887.

y Costa in the Bay of Tarentum and *Eupagurus Bernhardus* at pezia by Neumann.

Eleven Marseillese species occur in a single other locality in the Mediterranean or at a few points distant from Marseilles and from each other, namely :—

Gebia deltura, *Axius stirhynchus*, *Eupagurus Bernhardus* and *timidus*, *Crangon trispinosus* and *spinosus*, *Atelecyclus heterodon*, *Macropsis Slabberi*, *Siriella Clausii*, *armata*, and *crassipes*.

On the other hand, some species are found in all the localities, at Nice and Naples, in the Adriatic and in Algeria, or on the western coast of Spain, such as :—

Heterograpsus Lucasii, *Pachygrapsus marmoratus*, *Carcinus mœnas*, *Pisa tetraodon* and *Gibbsii*, *Stenorhynchus phalangium* and *longirostris*, *Ilia nucleus*, *Dromia vulgaris*, *Clibanarius misanthropus*, *Pagurus striatus*, *Eupagurus anachoretus* and *Prideauxii*, *Scyllarus ursus*, *Nika edulis*, and *Crangon cataphractus*.

These are species peculiar to temperate seas with the exception of the *Clibanarius*, which has been noted in boreal regions. Some others occur only along the western shores of France without passing north of the Channel; such are *Pachygrapsus marmoratus* and *Carcinus mœnas* [?]. Others ascend higher and abound in England, namely *Pisa Gibbsii*, the two *Stenorhynchi*, *Dromia vulgaris*, *Eupagurus Prideauxii*, *Scyllarus ursus*, and *Nika edulis*. A single species, *Pisa tetraodon*, exists in England, but seems to be absent in Gascony.

Of the 124 Marseillese species there are 45 common to Gascony and 55 belonging to the English fauna. On passing further to the north the relationship becomes more distant—the boreal provinces have scarcely 33 species which also occur at Marseilles. There is scarcely any relationship to the arctic seas—only three species are common, namely *Geryon longipes*, *Eupagurus Bernhardus*, and *Nebalia bipes*, and the first and third of these are abyssal.

The northern shores of Algeria have 71 species in common with Marseilles. The Canarian fauna contains scarcely 25 Marseillese species, a number which rises to 32 by the addition of some species from Senegambia and the Cape Verd. These are :—

Calappa granulata, *Nautilograpsus minutus*, *Pachygrapsus marmoratus*, *Gonoplax rhomboides*, *Carcinus mœnas*, *Bathynectes longipes*, *Liocarcinus holsatus*, *Portunus corrugatus* and *pusillus*, *Eriphia spinifrons*, *Xantho rivulosa*, *Lambrus massena*, *Pisa armata* and *tetraodon*, *Maia squinado*, *Machus dorhynchus*, *Calappa granulata*, *Dorippe lunata*, *Dromia vulgaris*, *Porcellana platycheles* and *longicornis*, *Diogenes varians*, *Galathea strigosa* and *squamifera*, *Virbius viridis*, *Eupagurus excavatus* and *Prideauxii*, *Scyllarus ursus*, *Gnathophyllum elegans*, *Palæmon treillianus*, and *Squilla mantis*.

Thus the Podophthalmous fauna of Marseilles includes 33 species which ascend into the boreal provinces and 33 in common with the Canaries, Cape Verd, and Senegambia. Of the latter 10 do not go further north than Marseilles or Portugal, namely :—

Plagusia squamosa, *Nautilograpsus minutus*, *Lambrus massena*, *Pisa armata*, *Ethusa mascarone*, *Dorippe lunata*, *Pagurus striatus*, *Diogenes varians*, *Gnathophyllum elegans*, and *Palæmon treillianus*.

The author considers that the Bay of Marseilles forms a very important geographical centre. The invertebrate faunas which it possesses present a mixed character, containing boreal and tropical species. This proves the existence of wide open communications during the Tertiary epoch, on the one hand with the boreal provinces through the Bay of Biscay and the south of Spain, on the other with the equatorial Atlantic.—*Comptes Rendus*, December 5, 1887, p. 1132.

On the supposed Peripheral Processes of the Clionæ. By M. E. Topsent.

In the calcareous walls of the galleries of the *Clionæ* numerous greenish-yellow or green filaments are found ramifying in the thickness of the perforated stones and shells, becoming slightly dilated here and there, and anastomosing or intercrossing in all directions. These have been described by M. N. Nassonow * as processes of the mesoderm of *Cliona stationis*, Nass., and he supposes them to indicate the points of activity of the perforating sponge. The author remarks that *à priori* this function seems very improbable, and on investigation he found that the filaments may be entirely wanting in shells attacked by *Cliona*, while they abound in old imperforate shells. He identifies the filaments with those of the vegetable parasites which have been long well known as perforating the calcareous parts of aquatic organisms, and suggests that when associated with *Cliona* the plants in question have simply availed themselves of the passages formed by the sponge to penetrate readily into the interior of the shells.—*Comptes Rendus*, December 12, 1887, p. 1188.

On the Formation of Vegetable Mould by the Action of certain Animals. By Dr. C. Keller.

The author's investigations, made under the tropics, and especially in the island of Madagascar, strikingly corroborate the discoveries of Darwin in this domain lying on the confines of biology and geology. Earthworms in point of fact have a most important action in the preparation of humus, and in Madagascar the principal part is performed by a colossal worm a metre in length, *Geophagus Darwinii*. In the coast region, as also in the mangrove-forests, the part of the earthworms in this work is fulfilled by Crustaceans, especially crabs.—*Session de la Soc. Helvétique des Sci. Nat.*, Août 1887 ; *Bibl. Univ.*, Nov. 15, 1887, p. 429.

* "Zur Biologie und Anatomie der *Cliona*," in Zeitschr. für wiss. Zool. Bd. xxxix. (1883).